Remarks/Arguments

Claim Amendments

In response to the rejection under 35 U.S.C. §101, Claims 1, 6-10, 17, and 20 have been amended to explicitly recite structural and functional interrelationships with the hardware and software of a computer. In particular, the claims have been amended to recite respective structural and functional interrelationships with processors, memory elements, and graphical user interface elements. The amendments are supported as follows:

"If the claim preamble, when read in the context of the entire claim, recites limitations of the claim, or, if the claim preamble is 'necessary to give life, meaning, and vitality' to the claim, then the claim preamble should be construed as if in the balance of the claim." *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165-66 (Fed. Cir. 1999). See also *Jansen v. Rexall Sundown, Inc.*, 342 F.3d 1329, 1333, 68 USPQ2d 1154, 1158 (Fed. Cir. 2003)" MPEP 2111.02.

In general, since the respective preambles of the claims recite computer-based methods or apparatus, it is inherent, if not explicit, that the method steps or apparatus means use computers and are executed by computers. Further, the claims all recite very concrete interrelationships that result in an option that is presented to a client for action by the client. Also, the source code submitted with the application clearly details the interrelationships. Further, the source code in general makes it is clear that the present invention is executed by a computer, including interrelationships among present invention and the hardware and software inherent in the computer.

The following is further exemplary support in the specification of the instant application for the claim amendments:

Using a processor in a computer to select a range, for example as recited in Claim 1, element (a), follows from paragraphs [0033], [0034], and [0035], and from paragraphs [0090] and [0091], which describe testing the CPU for the presence or absence of the SIMD (Single Instruction Multiple Data) instruction set. Storage of lattice nodes and epochs, for example, as

recited in Claim 1 (a), follows from paragraphs [0036] through [0039] of the specification, describing how the values are filled in, and from paragraphs [0088] and [0089], describing how nodes and epochs are used.

Using a processor to search, for example, as recited in Claim 1 element (b), is supported by paragraphs [0068] and [0069] in the specification, which describe some of the hardware efficiency considerations for a Pentium III processor. It is also supported by paragraph [0088] in the specification, which describes a function and gives a prototype for it - clearly showing that the function is not merely a mathematical function but is an effective procedure intended to be executed on a computer. Location of a lattice in the memory element, for example, as recited in Claim 1 (b), also supported by paragraph [0088] in the specification, by the references to the pointer variables lat and ep. It is well known programming terminology that "pointers" are references to specific locations in a computer's memory.

Using a processor to interpolate, for example, as recited in Claim 1 element (c), is supported by paragraph [0088] of the specification, which describes a Delphi function linearly interpolating option values on the state variable x and then linearly interpolating the just-obtained values on the index value s. It is also supported by paragraph [0089], which describes a Delphi function linearly interpolating option values on rt, the square root of the time to expiry t of the option.

Displaying an option on a graphical user interface is supported by source code file amdrv23p.pas, which performs windowed input and output processing.

In response to the rejection under 35 U.S.C. §112, second paragraph, Claim 1 has been amended to recite: "searching, using the processor, a lattice data structure, stored in the memory element, by applying said range from said group to said lattice data structure to identify at least one value in the lattice data structure included in said range, the at least one value comprising at least one intermediate value of said customized indexed call option;" and Claim 17 has been amended to recite: "means for searching, the means for searching including the processor, a lattice data structure, stored in the memory element, by applying said range from said group to said lattice data structure to identify at least one value in the lattice data structure included in said

range, the at least one value comprising at least one intermediate value of said customized indexed call option;"

The above amendments are supported by paragraphs [0088] and [0089] and the source code for the present application. In particular, starting at line 1327 of am23.dpr, we have the following source:

```
function getValueAtEpoch(s: double; x: double; const lat: PLattice;
                const ep: PEpoch): double; var
  pts1, pts2: PLine;
  ps: pointer;
  s1, s2, p, px, v1, v2, va: double;
  xi: integer;
begin

  s := max(s, 1.0001*ep.mins);
  s := min(s, 0.9999*ep.maxs);
  x := max(x, lat.minx+0.0001);
  x := min(x, lat.maxx-0.0001);


  binarySearch(@ep.stockVals[0],@ep.bdeltas,s,ps);
  pts1 := PLine(ps);
  pts2 := PLine(Pointer(Cardinal(ps)+sizeof(TLine)));
  s1 := pts1.si;
  s2 := pts2.si;
  p := (s-s1) / (s2-s1);
  xi := floor((x-lat.minx)*lat.rhx);
  px := lat.rhx*(x-lat.xvec[xi]);
  v1 := (1-px)*pts1.v[xi] + px*pts1.v[xi+1];
  v2 := (1-px)*pts2.v[xi] + px*pts2.v[xi+1];
  va := (1-p)*v1 + p*v2;
  Result := va;
end;

function getValue(const s: double; const x: double; t: double;
            const lat: PLattice): double; var
  ep1, ep2: cardinal;
  v1, v2, p: double;
  rt, rt1, rt2, hrt: double;
```

```
begin

  t := min(t,lat.tmax-0.0001);
  ep1 := (lat.nepochsint-1) - cardinal(floor(t*lat.rhtint));
  ep2 := ep1 - 1;
  rt := sqrt(t);
  rt1 := lat.epochs[ep1].rtim;
  rt2 := lat.epochs[ep2].rtim;
  hrt := rt2-rt1;
  p := (rt - rt1) / hrt;

  v1 := getValueAtEpoch(s, x, lat, @lat.epochs[ep1]);
  v2 := getValueAtEpoch(s, x, lat, @lat.epochs[ep2]);
  Result := (1-p)*v1 + p*v2;
end;
```

No new matter has been added.

Rejection of Claims 1, 6-10, 17, and 20 under 35 U.S.C. §101

The Examiner rejected Claims 1, 6-10, 17, and 20 under 35 U.S.C. §101 as being directed to non-statutory subject matter. Applicants respectfully traverse the rejection.

"Computer programs are often recited as part of a claim. USPTO personnel should determine whether the computer program is being claimed as part of an otherwise statutory manufacture or machine. In such a case, the claim remains statutory irrespective of the fact that a computer program is included in the claim. *The same result occurs when a computer program is used in a computerized process where the computer executes the instructions set forth in the computer program.*" (emphasis added) (MPEP 2106 IV B(a))

Each of the above claims has been amended to more clearly recite the interconnection of a computer program and a machine (computer) and the execution of instructions by a computer.

The following excerpt is from MPEP 2106.01 I:

"In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's

functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035."

The above claims recite a data structure that defines structural interrelationships between a processor, memory element, and graphical user interface (GUI). Further, the data structure recites functional interrelationships between the data structure and computer software and hardware. For example, in Claim 1, the processor performs various operations such as selecting, searching, and interpolating that involve the software and hardware. The interrelationships permit the data structure's functionality, which ultimately results in an option that can be acted upon by a holder.

For all the reasons noted above, Claims 1, 6-10, 17, and 20 are directed to statutory subject matter under 35 U.S.C. §101.

Applicants courteously request that the rejection be removed.

Rejection of Claim 1 and 17 under 35 U.S.C. §112, Second Paragraph

The Examiner rejected Claims 1 and 17 under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant respectfully traverses the rejection.

The Examiner stated: "In particular, Claim 1 lines 4-5 states "determine at least one intermediate value", it is unclear how one would determine one intermediate value of said customized index call option.. ."."

The Examiner stated: "In particular, Claim 17 lines 2-3 states "determine at least one intermediate value", it is unclear how one would determine one intermediate value of said customized index call option..."."

Applicants reaffirm, but for the sake of brevity, do not repeat the arguments of record regarding this rejection. However, in the interest of expediting prosecution, Claim 1 has been amended to recite: "searching, using the processor, a lattice data structure, stored in the memory element, by applying said range from said group to said lattice data structure to identify at least one value in the lattice data structure included in said range, the at least one value comprising at

least one intermediate value of said customized indexed call option;" and Claim 17 has been amended to recite: "means for searching, the means for searching including the processor, a lattice data structure, stored in the memory element, by applying said range from said group to said lattice data structure to identify at least one value in the lattice data structure included in said range, the at least one value comprising at least one intermediate value of said customized indexed call option;"

The amendments clearly recite the step of identifying one or more values in a data structure that are included in the range selected in the first element of the claim. That is, the range is applied to the data structure to identify certain values in the structure. As noted *supra*, further explanation is given in paragraphs [0088] and [0089] and the source code for the present application, in particular, the code starting at line 1327 of am23.dpr.

Applicants respectfully submit that amended Claims 1 and 17 particularly point out and distinctly claim the subject matter which applicant regards as the invention and are therefore definite under 35 U.S.C. 112, second paragraph.

Applicants courteously request that the rejection be removed.

Rejection of Claims 1-23 under 35 U.S.C. §102

The Examiner rejected Claims 1-23 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 7,024,384 (Daughtery). Applicant respectfully traverses the rejection.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Examiner's Arguments

Applicants respectfully submit that the Examiner has failed to adequately or specifically address the following arguments raised in Applicants' January 17, 2007 paper and raised again in Applicants' July 31, 2007 paper: Daughtery does not teach a customized indexed call option; Daughtery does not teach a term for an option; Daughtery does not teach more than one underlying for an option; and Daughtery does not teach switching underlyings. Instead, the

Examiner has cited blocks of Daughtery without providing any arguments as to how the citations are applicable.

It appears that the Examiner has substantially repeated the arguments from the Office Action dated May 31, 2007. As noted below, Applicants have reaffirmed the arguments of record. However, Applicants have added the following arguments for consideration:

A customized call option is recited in independent Claims 1, 6-10, 17, and 20. Paragraph [0014] of the specification for the instant application clearly describes what is meant by a customized indexed call option. As noted *infra*, there is no teaching, suggestion, or motivation in Daughtery regarding the customized indexed call option recited in Claims 1, 6-10, 17, and 20. Specifically, according to the limitations of the preceding claims, the option holder can choose different notional amounts at various times during the option term and still be guaranteed a nonnegative return. Daughtery has no such teaching, suggestion, or motivation.

Claims 1 and 17 recite a lattice recursion for the option value, as defined by paragraph [0023] of the specification for the instant application. Daughtery has no such teaching, suggestion, or motivation.

Claim 1

1. Daughtery does not teach an option with a term

For the sake of brevity, Applicants reaffirm, but do not repeat here the arguments of record.

2. Daughtery does not teach the ranges recited in Claim 1

For the sake of brevity, Applicants reaffirm, but do not repeat here the arguments of record.

3. Daughtery does not teach the searching recited in Claim 1

For the sake of brevity, Applicants reaffirm, but do not repeat here the arguments of record.

4. Daughtery does not teach the interpolation recited in Claim 1

For the sake of brevity, Applicants reaffirm, but do not repeat here the arguments of record.

5. Daughtery does not teach a term for an option

Claim 1 recites: "wherein said customized indexed call option comprises a term" As noted *supra*, Daughtery does not teach an option with a term. *In fact, Daughtery's entire focus is on an expirationless term.*

6. Daughtery does not teach more than one underlying for an option

Claim 1 recites: "an index linkage to an index and a constant growth rate ..." That is, the option recited in Claim 1 has two underlyings. In contrast, Daughtery teaches options with only a single underlying, for example, as recited in Claim 1 of Daughtery.

7. Daughtery does not teach switching between underlyings

For the sake of brevity, Applicants reaffirm, but do not repeat here the arguments of record.

For all the reasons noted above, Daughtery fails to teach each and every element of Claim 1. Therefore, Claim 1 is novel with respect to Daughtery. Claims 2 and 3, dependent from Claim 1, enjoy the same distinction with respect to Daughtery.

Claim 17

Claim 17 is an apparatus claim paralleling Claim 1; therefore, the arguments regarding Claim 1 are applicable to Claim 17 and Claim 17 is novel with respect to Daughtery. Claims 18 and 19, dependent from Claim 17, enjoy the same distinction with respect to Daughtery.

Claim 4

1. Daughtery does not teach a term for an option

Claim 4 recites: "a customized indexed call option with a specified term.." Applicants have shown *supra* in the arguments for Claim 1 that Daughtery teaches only an expirationless term and does not teach a term for an option.

2. Daughtery does not teach intervals in an option term

Claim 4 recites: "and specified notional amount *n* operatively arranged to allow an investor to choose notional amounts *n0* and *n1* at *specified intervals* within the term..." As noted *supra*, Daughtery does not teach a term for an option; therefore, Daughtery cannot teach intervals for an option term.

3. Daughtery does not teach multiple underlyings

In Claim 4 there are two underlyings (the specified interest rate associated with notional amount *n0* and the index associated with notional amount *n1*). Daughtery does not teach multiple underlyings.

For all the reasons noted above, Daughtery fails to teach each and every element of Claim 4. Therefore, Claim 4 is novel with respect to Daughtery.

Claim 5

1. Daughtery does not teach a term for an option

Claim 5 recites: "a customized indexed call option with a specified term..." Applicants have shown *supra* in the arguments for Claim 1 that Daughtery teaches only an expirationless term and does not teach a term for an option.

2. Daughtery does not teach intervals in an option term

Claim 5 recites: "and specified notional amount n operatively arranged to allow an investor to choose notional amounts n_i at specified intervals within the term ..." As noted *supra*, Daughtery does not teach a term for an option; therefore, Daughtery cannot teach intervals for an option term.

3. Daughtery does not teach multiple underlyings

In Claim 5 there are at least two underlyings and possibly more. The first is the specified interest rate associated with notional amount n_0, and the rest are the indices associated with notional amounts n_1 through n_k. Daughtery does not teach multiple underlyings.

For all the reasons noted above, Daughtery fails to teach each and every element of Claim 5. Therefore, Claim 5 is novel with respect to Daughtery.

Claims 6-10 and 20

Each of Claims 6-10 and 20 recite: "presenting, on a graphical user interface for the computer, an option for a holder of the customized indexed call option to switch between said index and said constant growth rate at predefined intervals during a term for said customized indexed call option, wherein said customized indexed call option comprises a term and an index linkage to an index and a constant growth rate."

This is the same limitation recited in Claim 1. Therefore, the arguments for Claim 1 are applicable to Claims 6-10 and 20 and Claims 6-10 and 20 are novel with respect to Daughtery.

Claims 11-16, dependent from Claim 10, enjoy the same distinction with respect to Daughtery. Claims 21 through 23, dependent from Claim 20, enjoy the same distinction with respect to Daughtery.

Applicants courteously request that the rejection be removed.

Item 7 in the Office Action

For the sake of brevity, Applicants reaffirm, but do not repeat here the arguments of record.

Conclusion

Applicant respectfully submits that all pending claims are now in condition for allowance, which action is courteously requested.

Respectfully submitted,

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